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ABSTRACT

Relationships among the Test Anxiety Scale for Children (TASC), the Lie Scale for Children (LSC), and sex were estimated from a pooled sample of 1,755 children in grades 1 to 10. Defensiveness and test anxiety showed equally strong sex differences; sex effects in test anxiety were not completely attributable to sex effects in defensiveness, but sex differences in defensiveness did magnify sex effects in test anxiety. Cross-lagged analysis of longitudinal data suggested that defensiveness had a causal impact on reporting of test anxiety, especially for boys. (Author/GDC)

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Defensiveness Effects on Sex Differences in Children's Test Anxiety

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Children's self-report measures of anxiety have been consistently and negatively related to measures of defensiveness. Children who deny concern or worry about scary dreams, the future, and what others think of them tend to score high on the Lie Scale for Children (LSC) and score low on the Test Anxiety for Children (TASC). Furthermore, sex differences in the TASC and LSC are often reported; boys frequently score higher than girls on defensiveness (the LSC) while girls frequently score higher on test anxiety (the TASC). I would like to report some data I have gathered on the relationships among these three variables: the child's sex, Test Anxiety Scale report, and Lie Scale report.

Two major notions for explaining sex differences in test anxiety have been forwarded: Maccoby and Jacklin (1974) suggested that girls score higher on anxiety scales because of scale content that reflects culturally transmitted sex-typed

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anxieties and fears. Hill and Sarason (1966) suggested that girls report more anxiety because they are less defensive, that is, more willing than boys to admit to anxiety. Obviously both explanations for sex differences could be simultaneously true; the content of the scale may reflect female stereotyped anxieties, and boys may be more defensive.

A recent paper by Douglas and Rice (1979), however, concluded that defensiveness is not a critical variable. Douglas and Rice tested 60 children on test anxiety and defensiveness and found significant sex differences for test anxiety but not for defensiveness. Furthermore, after covarying defensiveness, they still found significant sex differences in test anxiety. On this basis they concluded that defensiveness is not a critical variable and encouraged attention to the scale content notion. I was skeptical of Douglas and Rice's conclusion largely because of my experience with the TASC and LSC; sex differences in defensiveness have been as common as differences in anxiety. My skepticism and my exposure to Rosenthal's (1978) recent work on the importance of combining the results of studies prodded me to estimate the relationships among sex, the TASC, and the LSC over as large a sample as possible. What follows is based on results of studies done over a 20-year period in a variety of locales: Connecticut, Illinois, Texas, Mexico City. The total of 1755 children tested included children from grades one to ten.

I took the correlations for the three variables from each study and combined them using the r to z transformation and

weighting by sample size. Results were as anticipated; the average correlation between sex (males=1, females=2) and the TASC was positive, +.21, and the correlation between sex and the LSC was negative, -.20. The average correlation between the TASC and LSC was -.48. In terms of effect size these correlations represent small-to-moderate effects for the sex differences and a large effect for the TASC-LSC relationship (using Jacob Cohen's 1969 definition for effect size). Using a .20 corelation as an estimated effect size for sex differences on the TASC and LSC, I did a power analysis for a sample of 80 and a .05 one-tailed alpha level and came up with a probability of .56. Using a two-tailed test, the probability was .43. In other words, with a sample of 80 like that used by Douglas and Rice, one has roughly one chance in two of not finding a significant sex difference for either the TASC or the LSC when, in fact, small-to moderate effects do exist. A failure to find a significant sex effect for the LSC with a sample size of 80 cannot be taken as strong evidence for the unimportance of defensiveness.

The larger issue raised by Douglas and Rice is, however, the relationship between sex and test anxiety with the effects of defensiveness removed. To estimate this with my pooled data, I took the averaged correlations and calculated a part correlation between sex and TASC with the effect of defensivenss removed from the TASC scores. The part correlation was +.13, t=5.5, p<.001, indicating a significant relationship between sex and anxiety independent of

defensiveness--what Douglas and Rice found. Such a finding does not imply, however, that defensiveness plays no role in the sex-anxiety relationship. Defensiveness increments the sex-TASC R^2 from .017 to .044, i.e., raises the correlation from .13 to .21. In short, my mini-meta-analysis says: a) that there is a sex-anxiety relationship not attributable to sex differences in defensiveness, but b) that sex differences in defensiveness magnify anxiety sex differences. The data are not consistient with Douglas and Rice's contention that defensiveness is not a critical variable.

There is more evidence for the importance of defensiveness, evidence from a closer analysis of the TASC-LSC correlation. The consistent, large, negative relationship between these two scales could represent the presence of some common third factor or it could represent the causal influence of one variable on the other. The null hypotheses of the cross-lagged panel design holds that the relationship between two variables is due to some common third factor. A panel analysis is also an exploratory procedure for uncovering causal relationships between experimentally unmanipulatable variables. The two variables must be measured longitudinally on at least two occasions in order to establish time precedence. Given certain assumptions about measurement and stability, the focus of the analysis is on the absolute magnitude of the cross-lagged correlations, in this case the correlations between Time 1 TASC and Time 2 LSC, and Time 1 LSC and Time 2 TASC. If the relationship between the two is attributable to a

common cause, there should be no difference between these cross-lagged correlations. On the other hand, a significant difference between the cross-lags rejects the null hypothesis of a common cause and implies a causal link.

I applied the panel analysis to three independent longitudinal samples of elementary school children measured on the TASC and LSC in separate school years. The six correlations for the analysis were first calculated separately for the three samples and the pattern of correlations were similar in size and magnitude for each. Since the cross-lagged panel analysis has low power (Kenny, 1975), the three samples were grouped, creating a combined sample of 1,055 participants. Correlations were calculated for this combined sample and are presented in Figure 1. To test for stationarity, the synchronous correlations, -.468 and -.495, were tested and were found not to differ, $z=0.91$. Thus, the relationship between the TASC and LSC showed no evidence of change and the assumption of stationarity was judged to have been met.

Insert Figure 1 about here

The cross-lagged correlations were found to differ from each other, $z=2.07$, $p<.05$, with the LSC1-TASC2 correlation, -.284, exceeding the TASC1-LSC2 correlation, -.213, in absolute magnitude. The null hypothesis of a common third variable was therefore rejected. The pattern of correlations suggests that the LSC is casually predominant, since LSC1 is more strongly

related to TASC2 than TASC1 is to LSC2.

Many investigators have reported sex differences on the TASC (see Maccoby and Jacklin, 1974), so a supplementary analysis was carried out to evaluate possible sex differences in cross-lagged patterns. Intercorrelations were calculated separately for males (n=531) and females (n=524) and are presented in Figure 2.

Insert Figure 2 about here

No significant shifts in the synchronous correlations were found for males, z=-0.02, or for females, z=0.61. Although neither cross-lagged difference was significant at at the .05 level, the difference was much larger and approached conventional significance levels for males, z= 1.82, $p<.10$, but not for females, z=.40. Thus the causal asymmetry found in the combined analysis would appear to be due to consistency in patterning across both sexes combined with larger cross-lagged differences for the males. Sex differences were also found in the absolute magnitudes of the synchronous variables: TASC-LSC correlations were stronger for females than for males both at the first, z=2.01, $p<.05$, and the second occasion, z=2.54, $p<.05$. The LSC1-TASC2 cross-lagged correlation for females, -.292, tended to be stronger, z=1.59, than the same correlation for males, -.200, while the TASC1-LSC2 cross-lagged correlation for females, -.273, was significantly larger in absolute magnitude, z=2.80, $p<.01$, than the corresponding correlation

for males, -.108. Significant sex differences in the autocorrelations were not found, TASCz=0.87 and LSCz=.86. Thus, the sex differences analysis points to stronger TASC-LSC relations in females than in males, but greater TASC-LSC causal asymmetry in males than in females.

The finding of a cross-lagged difference in the overall analysis supports the hypothesis that the Test Anxiety and the Lie Scales for children are related in a nonspurious manner. Furthermore, the overall analysis indicates that defensiveness has a stronger relationship with subsequent test anxiety than anxiety has with subsequent defensiveness, implying that defensiveness has a causal effect on anxiety reports. Conscious or unconscious misrepresentation of universal concern and worry apparently affects children's reports of specific, test-related fear and worry. Defensiveness certainly appears to be responsible for some of the variation in test anxiety report, and the interpretation that highly defensive children are distorting their anxiety reports downward on the TASC is a reasonable one. These findings contradict Douglas and Rice's recent (1979) suggestion that "the willingness to disclose is not a critical variable," and imply, instead, that defensiveness is very important.

The causal importance of the LSC appears to be much stronger for boys than for girls, probably because boys are more highly defensive on average. At the same time the synchronous correlations between the TASC and LSC are stronger for females. Such a pattern suggests that the specific

anxieties reported on the TASC and the general concerns reported on the LSC are integrated more completely in females than in males. It may be the case that for girls the TASC and LSC represent aspects of the same general anxiety construct.

Defensiveness may prove to be an important variable in other personality research with children. If boys are generally less willing than girls to disclose anxiety and related feelings, and if this defensiveness effect extends to other self-report measures, sex differences on such measures are likely to be magnified by or confused with sex differences in defensiveness. In summary, we cannot ignore defensiveness when talking about anxiety. Sex differences on the LSC are as strong as for the TASC. Furthermore, panel analyses suggest that defensiveness has a causal impact on test anxiety report, particularly for boys.

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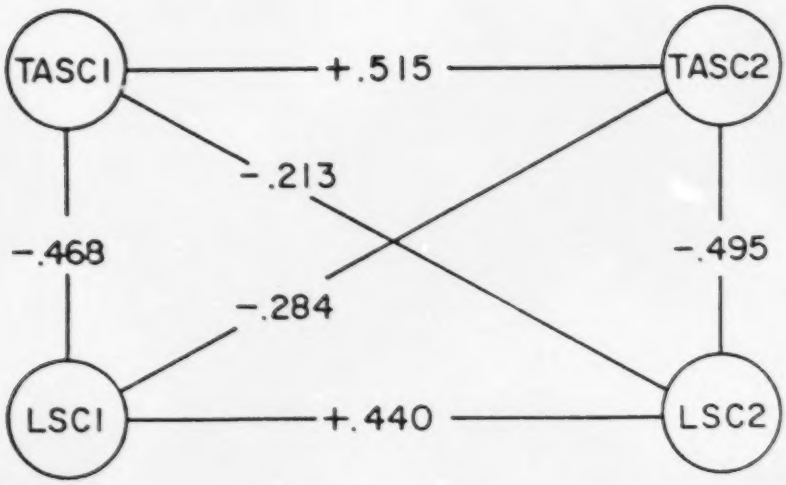
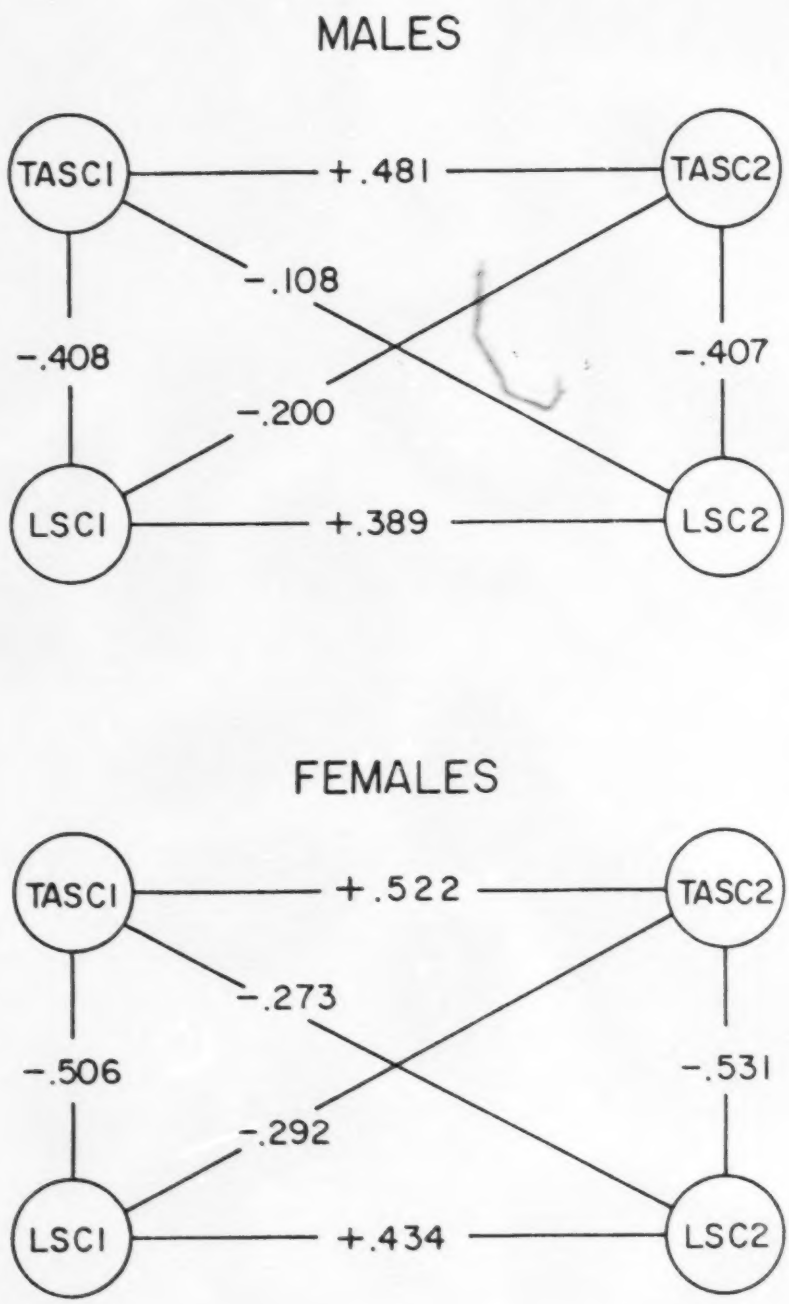


Figure 1. Cross-lagged correlations, combined sample ($\underline{n}$ = 1055).

Figure 2. Cross-lagged correlations, separately by sex (female n = 524, male n = 531).



Abstract

Relationships among the Test Anxiety Scale for Children (TASC), the Lie Scale for Children (LSC), and sex were estimated from a pooled sample of 1755 children in grades one to ten. Defensiveness (LSC) and test anxiety (TASC) showed equally strong sex differences; sex effects in test anxiety were not completely attributable to sex effects in defensiveness; but, sex differences in defensiveness did magnify sex effects in test anxiety. Cross-lagged analysis of longitudinal data suggested that defensiveness had a causal impact on text anxiety report, especially for boys.